FURTHER NOTES ON THE BRAIN OF THE SAUROPSIDA.

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1. A most notable feature of the cerebral hemispheres of such reptiles as the Alligator, Iguana and sea-turtle is the absence of a proper choroid plexus in the lateral ventricle. This is the more remarkable as in the amphibia, the choriod plexus is very well developed. The sea-turtle has a few vascular coils protruding into the lateral ventricle at its posterior portion; nothing of the kind can be identified in the Iguana or in birds.

2. On removing the inner cerebral wall of an Alligator's hemisphere it can be seen that the Corpus Striatum is continued into the pedicle of the olfactory bulb, as a distinct prominence. In fact the substance of the pedicle is in the main a continuation of the Corpus Striatum and of the basilar part of the hemisphere, the dorso-lateral cortex becoming attenuated to a mere film on entering that structure. The lumen of the pedicle is a continuation of that recess of the lateral ventricle which undermines the mesal side of the root of the Corpus Striatum.

3. The Corpus Striatum is relatively more massive in the Sauropsida, than in any other animal group. It reaches its maximum in birds, where also the lateral ventricle is most reduced. It seems as if a secondary fusion must occur, as explaining the apparent obliteration noted in the latter group.

4. A careful study of the structure designated as the anterior commissure of the reptile's brain has failed to convince me that this structure is to be considered as the homologue of the same commissure in the mammalian brain. So far I am inclined to consider it as representing the Corpus Callosum, at least in part. Its fibres are medullated.

5. The inner face of the hemispheric wall is finely striated; this is due to the fasciculation of the nerve fibres lying subjacent to the ventricle; they correspond to the Corona radiata.

6. It is not difficult to see that the greater part of the cerebral surface, that is, the entire basilar and more than half of its lateral aspect is the representative of what in the mammalia is the least voluminous and functionally the least important portion, namely of the Island of Reil and the præperforate region. In some reptiles (Chelydra, Boa) these two districts or their homologues are demarcated from each other by a shallow sulcus. The area homologous with the Island of Reil, corresponds pretty accurately to the base of the Corpus Striatum; the other, represented in mammals by the *Substantia perforata anterior* is a bodily continuation of the thalamic halves, a marked constriction separates them from the thalami proper, on the dorsal surface. Perhaps they constitute a species of prothalamus.

There remains then as the representative of the convoluted portion of the cerebral hemispheres of the placental mammalia, merely the delicate thin walled portion of the reptilian cerebrum. It is here where the pyramidal nerve cells are found in the best development. In the tenuity of the subjacent nerve layer, it closely resembles the hemispheric wall of the mammalian embryo.

7. There are two varieties of cerebelli found in the Sauropsida; to these might be added a third or fundamental type from which the other or divergent types may be derived.

The fundamental type is found in serpents and apodal lacertians, as well as in Chelonia of a low type (Boa, Bascanion, Pseudopus, Chelydra). Here the cerebellum is a mere lip covering the entrance to the mesencephalic ventricle, as in the Amphibia, and in embryos.

The second type is found in the higher Chelonia (Cistudo, Naunemys, Calemys, Thalassochelys) and the Crocodilia (Alligator). Here the lip has become inflated, and extends like a hollow hood directly backwards over the fourth ventricle. It corresponds in its best development to nothing so much as to a baseball cap. This resemblance is heightened by the presence in the Alligator and Thallassochelys of a distant rim. I have found, in an individual of Cistudo, the Cerebellar cap dented from above, and turned inside out, as it were; the individual had suffered prolonged starvation.

The third variety is found in lacertians (Iguana) and birds (Struthio, Aro, Trichoglossus, Gallus, Columba, Phœnicopterus, etc). Here the cerebellar lip creeps up, as it were, on the posterior declivity of the optic (and post optic) lobes, firmly tied down to these by the arachnoid. In birds the lip becomes reflected from the highest point, and descends backwards.

The highest form of the second variety is found in the Alligator, where in the adult and in larger specimens, though not in the one or two-year-olds, there are distinct transverse sulci. In the sea-turtle an indication of transverse sulci is observed in hardened specimens; they may be artifacts, however.

8. An important feature of the reptilian brain are the lateral eminences of the Oblongata, which, from their connection with the eighth pair of cranial nerves, merit the designation of *eminentiæ acusticæ*. A reliquary fragment in the mammalia constitutes the Fasciola cinerea. But the greater portion of this, in reptiles (Alligator, Iguana) exceedingly complicated body seems to be a sort of herald of a higher cerebellar development, and the very similar lateral bodies of the human embryonic Oblongata appear to be swallowed up in the cerebellar mass. Future research must determine whether the *nuclei dentati* are derivable from these masses or whether some of the lesser cerebellar lobules monopolize them. In the Alligator they closely simulate cerebellar *folia*, and consist of gray and white substance. It is from them that arises the *eminentia transversa ventriculi quarti* so well developed in the Iguana and Alligator. In the latter the acoustic convolvuli are in morphological connection with the lateral kink of the cerebellum.

9. On comparing a series of animals beginning with the Amphibia, passing thence to the Sauropsida and ending with the mammalia, we find that there is this close correspondence to a series of mammalian embryonic and fœtal brains, that while in the lowest types the nerve fibres of the spinal cord are well provided with *myelin*, and the Oblongata presents the same maturity of structure, that it is only in higher types that the Cerebellum and Mesencephalon show the same or an approximate histological advance, which involves the Thalamus and Cerebrum in their entity only in the very highest types. This is an important confirmation of the laws laid down by Flechsig and Meynert.

ASTRONOMY.

The Morrison Observatory.

The Morrison Observatory—the gift of Miss Morrison, a former resident of Glasgow—was built at Glasgow, Missouri, in 1875. The building is well adapted to the purpose it is intended to serve, and was cons ructed under the supervision of Prof. C. W. Pritchett, who consulted several of the leading astronomers of the country in preparing his plans.

The position of the observatory is, latitude, 39° 16′ 16.8″ north. Longitude $1^h\ 3^m\ 5.93^s$ west of Washington. The latitude was obtained from observations recently made with the Transit Circle, and discussed by Prof. H.S. Pritchett; the longitude from an exchange of signals made with the United States Naval Observatory in 1880.

For instrumental equipment, the Morrison Observatory possesses one of Clark's finest 12¼ equatorials. It is of 17 feet focal length, and has already been the means of discovering a number of faint double stars. In 1877 and again in 1879, a large number of observations of the satellites of Mars were obtained. *Mimas* has been ob-